



The engineer's choice

**ebmpapst**

8412 N/2GHP

INDEX

- 1 General ..... 3**
- 2 Mechanics ..... 3**
  - 2.1 General ..... 3
  - 2.2 Connections ..... 3
- 3 Operating Data ..... 5**
  - 3.1 Operating Data - Electrical Interface - Input ..... 5
  - 3.2 Electrical Operating Data ..... 7
  - 3.3 Operating Data - Electrical Interface -Output ..... 8
  - 3.4 Electrical Features ..... 9
  - 3.5 Aerodynamic ..... 10
  - 3.6 Sound Data ..... 10
- 4 Environment ..... 11**
  - 4.1 General ..... 11
  - 4.2 Climatic requirements\*) ..... 11
- 5 Safety ..... 12**
  - 5.1 Electrical Safety ..... 12
  - 5.2 Approval Tests ..... 12
- 6 Reliability ..... 12**
  - 6.1 General ..... 12

**1 General**

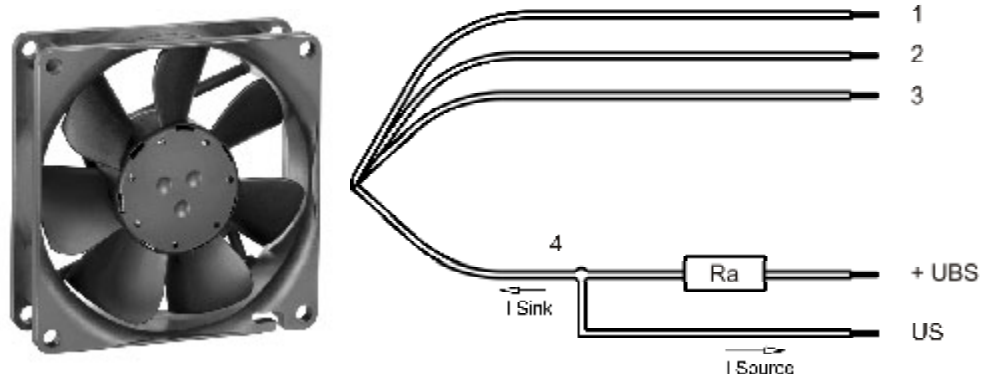
Fan type	Fan	
Rotational direction looking at rotor	counterclockwise	
Airflow direction	Air outlet over struts	
Bearing system	Sleeve bearing	
Mounting position	any	

**2 Mechanics****2.1 General**

Width	80,0 mm	
Height	80,0 mm	
Depth	25,4 mm	
Weight	0,095 kg	
Housing material	Plastic	
Impeller material	Plastic	
Max. torque when mounted across both mounting flanges	wire outlet corner: 50 Ncm remaining corners: 70 Ncm	
Screw size	ISO 4762 - M4 degreased, without an additional brace and without washer	

**2.2 Connections**

Electrical connection	Wires	
Length of lead wire	L = 310 mm	
Tolerance	+/- 10,0 mm	
Wire gauge (AWG)	26	
Insulation diameter	1,35 mm	
Contact	see drawing	



	Colour	Operation
Wire 1	red	+ UB
Wire 2	blue	- GND
Wire 3	violet	PWM
Wire 4	white	Tacho

The auxiliaries shown on the schematic diagram (which are required for the intended use) are not part of our delivery.

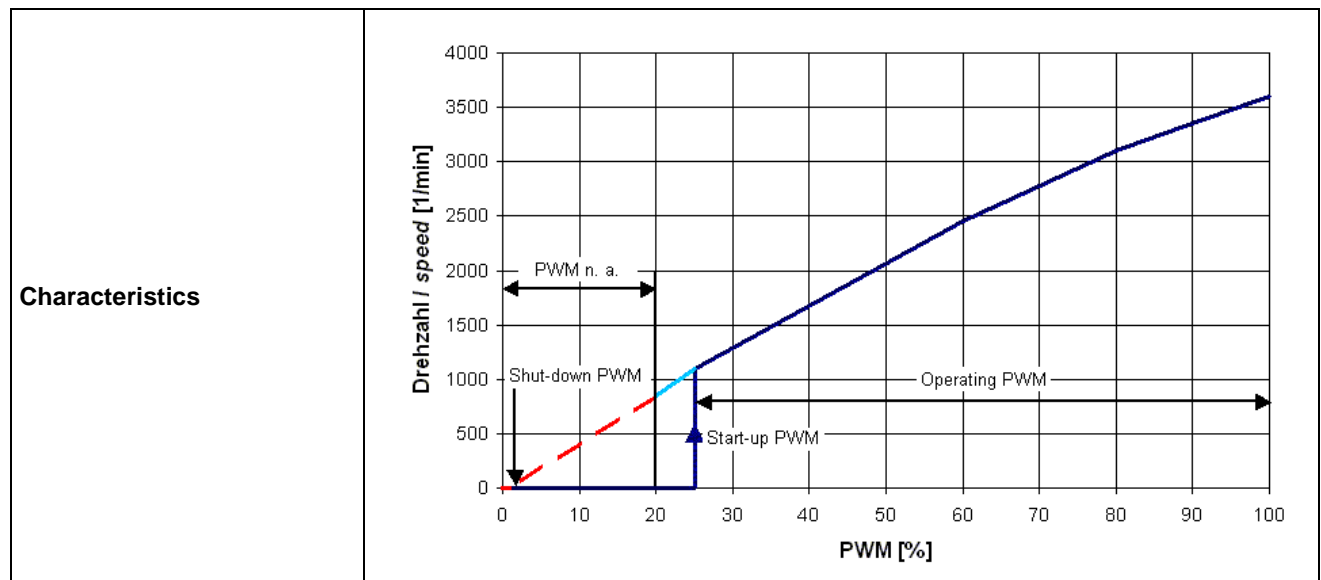
### 3 Operating Data

#### 3.1 Operating Data - Electrical Interface - Input

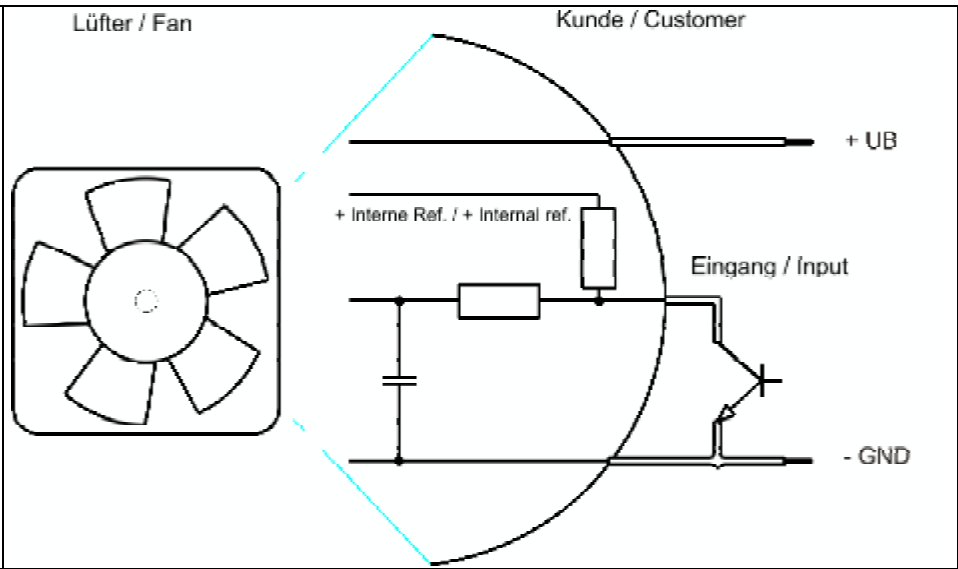
Control input	PWM
---------------	-----

#### Features

Input type	Open collector / TTL	
PWM - Frequency		21 kHz - 28 kHz Typical: 25 kHz
Max. voltage for logic "Low"		0,8 V
Max. voltage for logic "High"	Open circuit voltage	5,25 V
Maximum source current	short circuit current	$\leq 5$ mA
4 wire startup condition	PWM duty cycle	$> 25$ %
4 wire operation condition after startup	PWM duty cycle	20 % - 100 %
Shutdown condition	PWM duty cycle	$< 1$ %
Typical time until warm restart	After shutdown by PWM	$\sim 1,2$ s



Schematics



### 3.2 Electrical Operating Data

Measurement conditions: Normal air density = 1,2 kg/m<sup>3</sup>; Temperature 23°C +/- 3°C; Motor axis horizontal; warm-up time before measuring 5 minutes (unless otherwise specified). In the intake and outlet area should not be any solid obstruction within 0,5 m.

$\Delta p = 0$ : corresp. to free air flow (see section 3.5)  
 I: corresp. to arithm. mean current value

Name	Condition
PWM 0001	PWM: 100 %; f: 25 kHz

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	10,8 V		13,2 V
Nominal voltage	$\Delta p = 0$	$U_N$		12,0 V	
Power consumption	$\Delta p = 0$	P	2,4 W +/- 17,5 %	3,0 W +/- 12,5 %	3,7 W +/- 15,0 %
Tolerance	PWM 0001				
Current consumption	$\Delta p = 0$	I	220 mA +/- 17,5 %	250 mA +/- 12,5 %	280 mA +/- 15,0 %
Tolerance	PWM 0001				
Speed	$\Delta p = 0$	n	3.350 1/min +/- 12,5 %	3.600 1/min +/- 7,5 %	3.900 1/min +/- 10,0 %
Tolerance	PWM 0001				
Starting current consumption				335 mA	

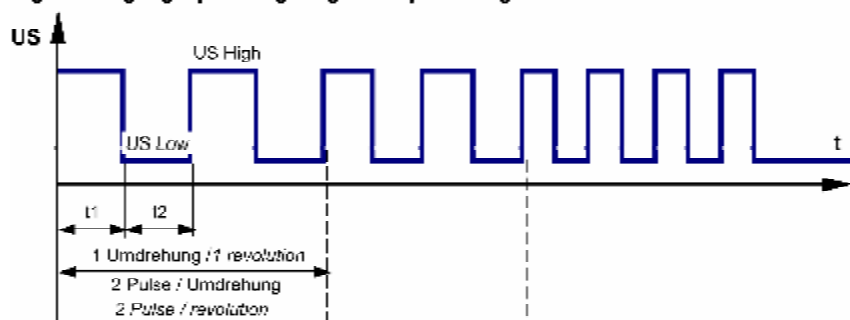
Name	Condition
PWM 0002	PWM: 50 %; f: 25 kHz

Features	Condition	Symbol	Values		
Voltage range	$\Delta p = 0$	U	10,8 V		13,2 V
Nominal voltage	$\Delta p = 0$	$U_N$		12,0 V	
Power consumption	$\Delta p = 0$	P	0,7 W	0,9 W	1,1 W
Tolerance	PWM 0002		+/- 17,5 %	+/- 15,0 %	+/- 15,0 %
Current consumption	$\Delta p = 0$	I	65 mA	75 mA	80 mA
Tolerance	PWM 0002		+/- 17,5 %	+/- 15,0 %	+/- 15,0 %
Speed	$\Delta p = 0$	n	1.750 1/min	1.950 1/min	2.200 1/min
Tolerance	PWM 0002		+/- 12,5 %	+/- 10,0 %	+/- 10,0 %

### 3.3 Operating Data - Electrical Interface -Output

Tacho type	/2 (Open collector)
------------	---------------------

Signal-Ausgangsspannung / Signal output voltage



$$R_a = \frac{U_{BS} - U_{S \text{ Low}}}{I_{\text{Sink}}}$$

Lüfter-Drehzahl / Fan speed





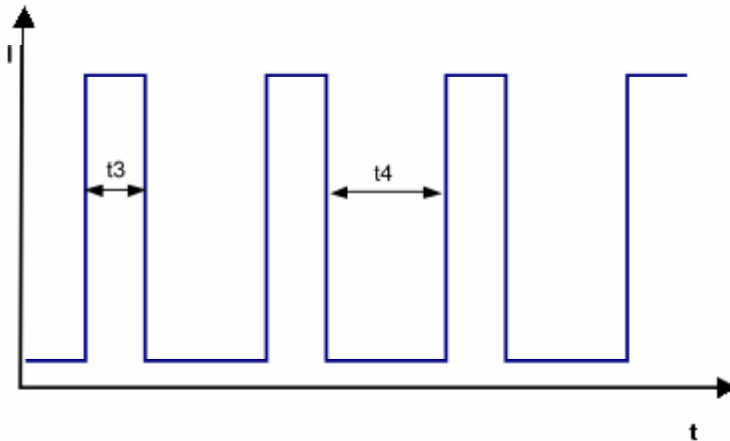
Features	Note	Values
Tacho operating voltage (UBS)		$\leq 28 \text{ V}$
Tacho signal Low	I sink: 2 mA	$\leq 0,4 \text{ V}$
Tacho signal High	I source: 0 mA	28 V
Maximum sink current		$\leq 4 \text{ mA}$
External resistor	External resistor Ra from UBS to US required. All voltages measured to GND.	
Tacho frequency	$(2 \times n) / 60$	120 Hz
Tacho isolated from motor	No	
Slew rate		$\Rightarrow 0,5 \text{ V/us}$

Alarm type	None
------------	------

### 3.4 Electrical Features

Electronic function	Speed-Controlled	
Reversed polarity protection	Rectifying diode	
Max. residual current at Un	IF $\leq 8 \text{ mA}$	
Locked rotor protection	Auto restart	
Locked rotor current at Un	approx. 335 mA	
Clock signal t3/t4 at locked rotor	Typical: 0,27 s / 1,2 s t3: 0,11 s... 0,67 s t4: 0,41 s... 3,8 s	



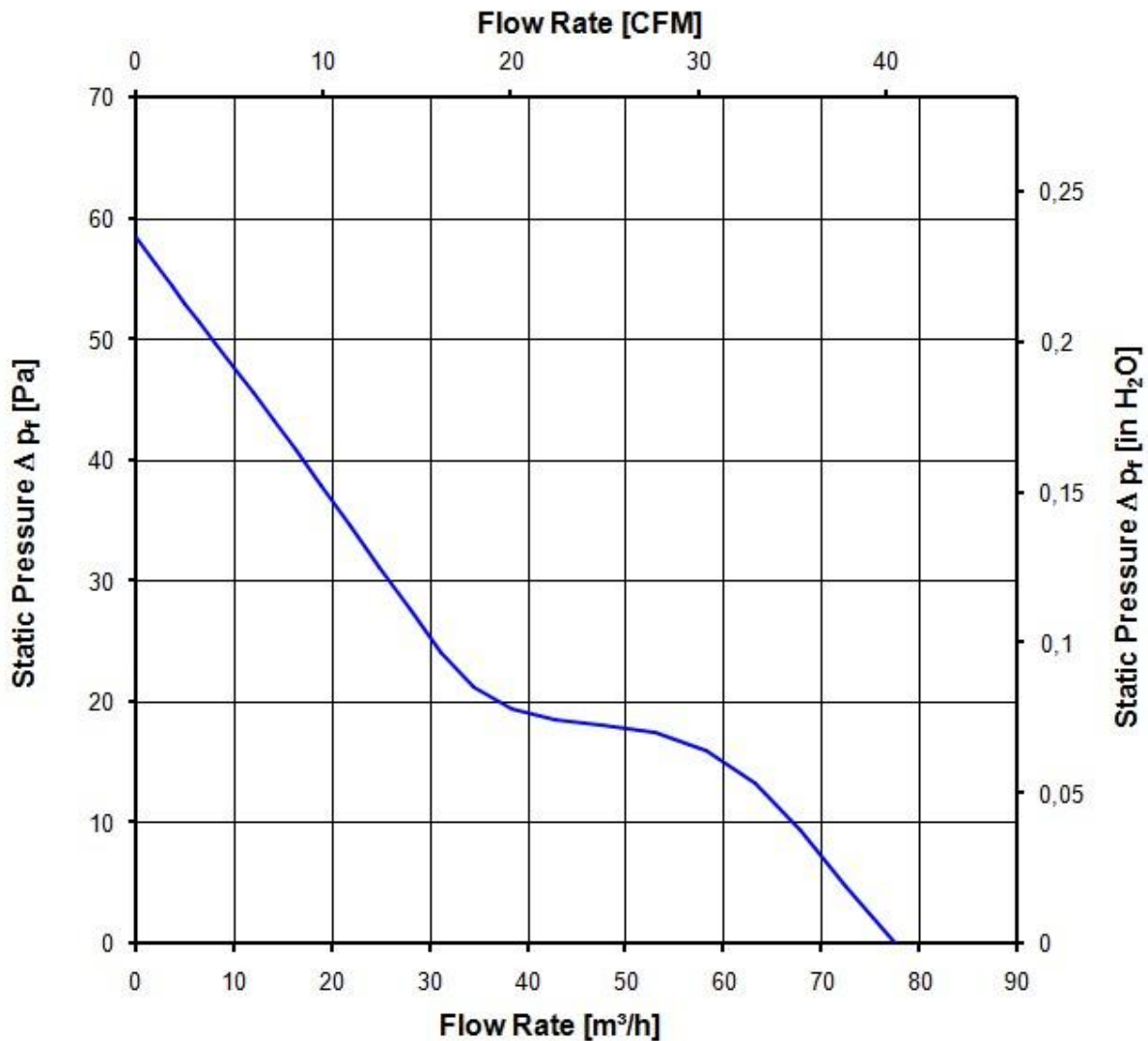
**3.5 Aerodynamic**

Measurement conditions: Measured with a double chamber intake rig acc. to DIN EN ISO 5801.  
 Normal air density = 1,2 kg/m<sup>3</sup>; Temperature 23°C +/- 3°C;  
 In the intake and outlet area should not be any solid obstruction within 0,5 m.

a.) Operation condition:

3.600 1/min at free air flow	PWM 100 %; f: 25 kHz		
------------------------------	----------------------	--	--

Max. free-air flow ( $\Delta p = 0 / \dot{V} = \text{max.}$ )	78,0 m <sup>3</sup> /h	
Max. static pressure ( $\Delta p = \text{max.} / \dot{V} = 0$ )	58 Pa	



**3.6 Sound Data**

Measurement conditions: Sound pressure level: 1 Meter distance between microphone and the air intake.  
 Sound power level: Acc. to DIN 45635 part 38 (ISO 10302)  
 Measured in a semianchoic chamber with a background noise level of Lp(A) < 5 dB(A)  
 For further measurement conditions see section 3.5

a.) Operation condition:

3.600 1/min at free air flow	PWM 100 %; f: 25 kHz	PWM min.:	PWM max.:
------------------------------	----------------------	-----------	-----------

Optimal operating point	64,0 m <sup>3</sup> /h @ 14 Pa	
Sound power level at the optimal operating point	5,0 bel(A)	
Sound pressure level at free air flow, measured in rubber bands	37,0 dB(A)	

## 4 Environment

### 4.1 General

Min. permitted ambient temperature TU min.	0 °C	
Max. permitted ambient temperature TU max.	70 °C	
Min. permitted storage temperature TL min.	-40 °C	
Max. permitted storage temperature TL max.	80 °C	

### 4.2 Climatic requirements \*)

Humidity requirements	humid heat, constant; according to DIN EN 60068-2-78, 14 days	
Water exposure	None	
Radiation exposure	None	
Dust requirements	None	
Salt fog requirements	None	
Harmful gas requirements	None	

\*) Permitted application area:

The product is intended for use in sheltered rooms with controlled temperature and controlled humidity. Directly exposure to water must be avoided.

Pollution degree 1 (according DIN EN 60664-1)

There is either no pollution or it occurs only dry, non-conductive pollution. The pollution has no negative impact.

Please require severity levels and specification parameters from the responsible development departments

## 5 Safety

### 5.1 Electrical Safety

Dielectric strength DIN EN 60950 (VDE 0805) and DIN EN 60335 (VDE 0700) A.) Type test Measuring conditions: After 48h of storage at 95% R.H. and 25°C. No arcing or breakdown is allowed! All connections together to ground. B.) Routine test Measuring conditions: At indoor climate. No arcing or breakdown is allowed! All connections together to ground.	Not applicable  Not applicable	
Isolation resistance Measuring conditions: After 48h of storage at 95% R.H. and 25°C measured with U=500 VDC for 1 min.	RI > 10 MOhm	
Air and leakage distances	1,0 mm / 1,2 mm	
Protection class	III	

### 5.2 Approval Tests

CE	Yes
UL	Yes / UL507, Electric Fans
VDE	Yes / Approval acc. to EN 60950 (VDE 0805) - Information technology equipment
CSA	No
CCC	No

The approval tests are observed to:

Maximal permitted operating voltage (see section 3.1) and max. permitted ambient temperature TU max.

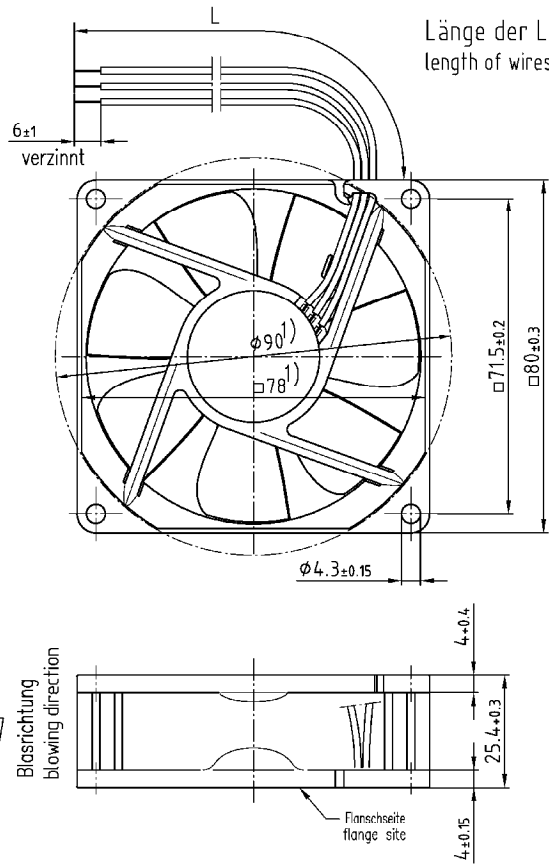
## 6 Reliability

### 6.1 General

Life expectancy L10 at TU = 40 °C	70.000 h	
Life expectancy L10 at TU max.	35.000 h	
Life expectancy L10 Delta (40 °C)	140.000 h	

Copying of the format and using it is, others and the use or reproduction of the content, names of companies or trademarks is prohibited. All rights are reserved. In the event of a patent or the registration of a utility model or design.

Schwermetalle nach DIN ISO 10078 beschränkt  
Refer to protection notice DIN ISO 10078



1) Maße für Montagewand

1) dimensions for assembly wall

Axialspiel bei

axial clearance by

- Kugellagerung (K): 0 (mit Federausgleich)
- Gleitlagerung (G): 0.1 - 0.9

- ball bearing (K): 0 (with spring compensation)
- sleeve bearing (G): 0.1 - 0.9

SAP-Status/State		Artid.-Nr./Change-No.		AutCAD-System-Version		ebmpapst		Werkstoff/Material:		Volumen/Volume (mm <sup>3</sup> )	
				Datum/Date		Name/Name		CAD-Umgebung/ CAD-Environment		Gewicht/Mass (g):	
				Bearb./Drawn				Artikel/Title			
Tolerierung/Tolerances:				Gepr./Checked							
Allgemeintoleranzen/Gen. tolerances:				Freig./Released							
				<b>ebmpapst</b>		Zchg.-Nr./Drawing.-No.:		Ers.f.Zchg./Replaces:			
						Dokumenttyp/Type of Document		Teilnummer/ Blatt/Page		Index/Index	
				ebm-papst St. Georgen GmbH & Co. KG						Maßstab/scale	

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [DC Fans](#) category:*

*Click to view products by [ebm papst](#) manufacturer:*

Other Similar products are found below :

[614R](#) [AUB0612L](#) [AFB0948HH-S687](#) [G2E085-AA05-10](#) [4318/12T](#) [AUB0912H-F00](#) [3412N/2ME](#) [W2G110-AM39-01](#) [8412GLV](#) [8412NGL-12](#) [6448-384](#) [4114N/17-251](#) [622/2N](#) [4318/2R](#) [4412F/2D](#) [424JMU](#) [4414/2HH](#) [4112 N/12GL-175](#) [9GA0912F402](#) [9GA0812B20011](#)  
[AFB0824SHBAV1](#) [DV5214/2NP-230](#) [9GA0912H4021](#) [THC1548MGDJJ](#) [GFB1224SHG](#) [8500NU](#) [DC0401012V2B-3T0](#) [7F.20.9.024.3100](#)  
[ASFP12391](#) [ASFP12392](#) [ASFP80372](#) [ASFP92391](#) [MF92251V3-1000U-G99](#) [3254J/2HPU](#) [9A0612G402](#) [AD5012HB-C71](#) [AD5012MB-C71](#)  
[ASFP84372](#) [ASFP64372](#) [026758A](#) [3258J/2H3PU????](#) [412/2H](#) [4292](#) [MF60152V1-1000U-G99](#) [3610KL-04W-B50-D00](#) [109P0412K3023](#)  
[EE92251B1-000U-F99](#) [8218J/2H4P](#) [PE60251B1-000U-G99](#) [PF60381B1-000U-S99](#)